second means for supplying field current to said field coil when said self-excited voltage is detected;

a1 cancel

a bypass circuit having a variable resistance, connected between said armature coil and a ground, for bypassing leak current flowing in said armature to the ground; and

third means for decreasing said variable resistance of said bypass circuit when said second means does not supply field current and increasing said variable resistance of said bypass circuit when said second means supplies field current to said field coil.

a2

3. (Amended) The voltage regulator as claimed in claim 1, wherein said third means comprises a circuit for decreasing said resistance of a bypass resistor after increasing said resistance for a predetermined duration.

4. (Amended) The voltage regulator as claimed in claim 1, wherein

said first means comprises a power drive circuit including a pulse conversion circuit for converting said self-excited voltage into a binary pulse signal;

said second means comprises a control circuit for controlling said field current, and a power circuit connected to said control circuit, wherein said power-drive circuit supplies electric power to said power circuit according to said binary pulse signal.

5. (Amended) The voltage regulator as claimed in claim 4, wherein said armature coil of said AC generator includes a plurality of phase-windings; and said pulse conversion circuit comprises a number of comparators respectively connected to the same number of said phase-windings to convert said self-excited voltage into a binary pulse signal having the same number of times as many frequencies as said self-excited voltage.

a3

8. (Amended) A voltage regulator of a vehicle AC generator including a field circuit having a field coil and a plurality of magnetic poles and an output circuit having an armature coil, said voltage regulator comprising:

a control circuit for supplying field current to said field coil;

a power circuit for supplying electric power to said control circuit to operate the same;

a3 cont.

first means for detecting a self-excited voltage generated in said armature coil;

a power drive circuit for controlling said power circuit according to the self-excited voltage induced in said armature coil, said power drive circuit including a pulse conversion circuit for converting said self-excited voltage into a binary pulse signal;

a bypass circuit having a variable resistance, connected between said armature coil and a ground, for bypassing leak current flowing in said armature coil to the ground; and

second means for decreasing said variable resistance of said bypass circuit when said power circuit does not supply electric power to said control circuit and increasing said variable resistance of said bypass circuit when said power circuit supplies electric power to said control circuit.

9. (Amended) A voltage regulator of a vehicle AC generator for charging a battery, said AC generator including a field circuit having a field coil and a plurality of magnetic poles, an output circuit having a plurality of phase-windings and a rectifier unit for providing DC output power, said voltage regulator comprising:

means, connected to a portion of said phase windings, for detecting a self-excited voltage that is induced in said phase windings by a residual magnetic field;

a switching circuit for controlling field current to be supplied to said field coil;

a switch control circuit for controlling said switching circuit;

a power circuit connected to said switch control circuit; and

a power-drive circuit including a pulse conversion circuit for converting said self-excited voltage into a binary pulse signal, said drive circuit driving said power circuit for a predetermined period starting from an edge of said binary pulse signal, wherein said pulse